16(1) AUTHOR:

Eydus, D.M.

SOV/20-125-3-11/63

TITLE:

On the Principle of the Limit Absorption (O printsipe predelingo pogloshcheniya)

PERIODICAL:

Doklady Akademii nauk SSSR,1959,Vol 125,Nr 3,pp 508-511 (USSR)

ABSTRACT:

According to the principle of the limit absorption the boundary value of that solution of

(3) $gu = (\lambda + \ell i)u + f$

which satisfies (2) and belongs to L_2 is denoted as the solution of the boundary value problem

(1)
$$g u = -\sum_{i,j=1}^{3} \frac{\partial}{\partial x_{i}} \left(a_{ij}(x) \frac{\partial u}{\partial x_{j}} \right) + q(x)u = \lambda u + f(x)$$

(2)

u|_ = 0

where (1) is elliptic and Γ the boundary of the infinite domain Ω in which (1) is defined. The principle is proved in some special cases by A.G. Sveshnikov / Ref 1,2 7 and by A.Ya.Povzner / Ref 3 7. The author devotes the present paper to the proof

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On the Principle of the Limit Absorption

SOV/20-125-3-11/63

of the principle in the case of a finite domain Ω or in the case of an Ω , the infinite part of which is a cylinder. Also in a special case then the principle of the limit amplitude of A.N. Tikhonov and A.A. Samarskiy / Ref 5 7 is considered. Altogether there are formulated 7 theorems without proof. The author mentions a paper of O.A. Ladyzhenskaya

[Ref 6.7. There are 7 references, 6 of which are Soviet, and 1 English.

PRESENTED:

December 18,1958, by V.I. Smirnov, Academician

SUBMITTED:

December 10,1958

Card 2/2

16.3500

3752h \$/039/62/057/001/001/002 B125/B112

HERMAN SAN

AUTHOR:

Eydus, D. M. (Leningrad)

TITLE:

The problem of limiting absorption

PERIODICAL:

Matematicheskiy sbornik, v. 57 (99), no. 1, 1962, 13-44

TEXT: The elliptic differential equation gu = $-\sum_{k,l=1}^{m} \partial/\partial x_k (a_{kl}(x)\partial u/\partial x_l)$

 $+q(x)u = \Lambda(u)+f(x)$ (1) with the boundary condition $u|_{\Gamma}=0$ is considered in an unbounded region Ω of the m-dimensional space R_m . Γ is the boundary of the region Ω , and Λ is a point of the continuous spectrum of the operator considered in the complex space $L_2(\Omega)$. The solution to the equation

gu = $(\wedge + \varepsilon i)u+f$, which satisfies the condition $u|_{\Gamma} = 0$ and pertains to $L_2(\Omega)$, is designated as a limit for $\varepsilon \to +0$ or $\varepsilon \to -0$. Among other

results, an extension of the classical thecems for an unambiguous solution to the external Dirichlet problem of the Helmholtz equation makes it possible to establish a general differential equation for an unbounded

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S/039/62/057/001/001/002 B125/B112

The problem of limiting absorption

region with any finite boundary. The solution of Gu = Au+f, which satisfies $\int |(\partial u/\partial r) - i \sqrt{\lambda} u|^2 dS = 0 \quad (24), \text{ is unambiguous}$ the condition of emission lim ρ+∞ S_ρ

for $\Lambda \in A$. Here, $Gu = (\Lambda + \epsilon i)u + f$, and A is the set of all positive Λ . For $\lambda \in O$ the solution u_{ϵ} of the equation $Gu = (\lambda + \epsilon i)u + f$ tends to the solution for the equation $\overline{G}u = \lambda u + f$ which satisfies condition (24). The problem of the limiting amplitude is now considered in its application to the equation $d^2w/dt^2+Gw = fe^{-i\sqrt{\Lambda}t}$ (50) with the initial conditions $w \mid_{t=0} = \xi_1, dw/dt \mid_{t=0} = \xi_2$ (51). Under limiting conditions the problem

(50)-(51) has such a solution for $\Lambda = 0$ that $\lim_{x \to 0} we^{i\sqrt{\lambda}t} = u_{+}(x, \Lambda)$.

Convergence is uniform in every internal bounded region wc Ω . All that has been said above applies especially to a region Ω consisting of Ω and \mathbb{R}^n , which is designated as a "cylindrical tube." The finite part Ω ! is enclosed by a sphere, and \mathbb{R}^n is a semi-infinite cylinder.

September 19, 1960 SUBMITTED:

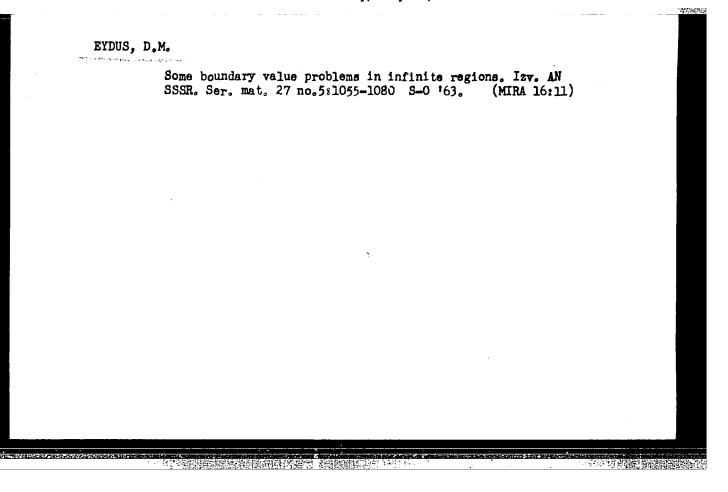
Card 2/2

L 13118-63 AUTHOR: Eydus, D. M. The principle of limiting absorption in the theory of resilience TITLE: Leningrad. Universitet. Vestnik, no. 7. Seriya matematiki, mekhaniki PERIODICAL: i astronomii, no. 2, 141-154 Employing the following terminology. Ω is an infinite region (in the article, region means open set), of variables x1, x2, x3, which appears as the externality of a closed piecewise continuously differentiable surface, Γ , $\Gamma^{:}$ is a certain closed surface located within Ω and dividing Ω into two portions (1) and (2), with (1) denoting a finite region and (2) an infinite one, $\mathcal N$ and $\mathcal M$ are two piecewise constant functions assigned within Ω , with $N = N_k$, $M = M_k$, in $\Omega^{(k)}$, and k = 1, 2 and N_k , M_k being positive constants. the author sets himself the problem of finding within region the displacement Card 1/2

L 13118-63

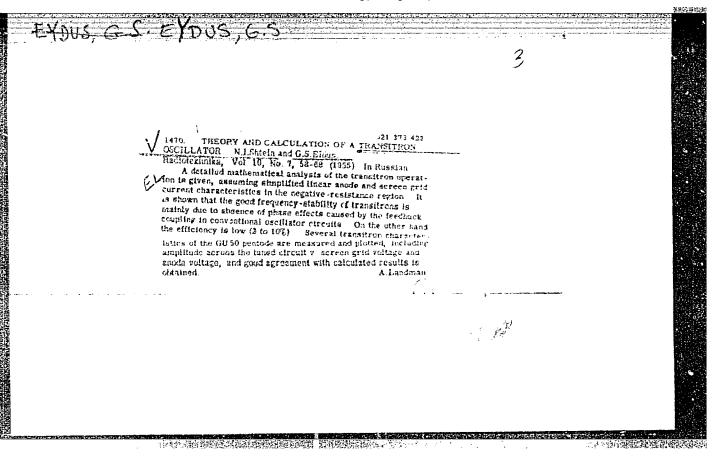
The principle of limiting

vector U, which satisfies the equation $gU \equiv -\mu \Delta U - (\mathcal{N} + \mu) \text{ grad div } U = \sigma U + F(x),$ where x is a point in region Ω , σ is a positive constant to the boundary condition in $[T(U)]_{\Gamma} = 0$ where $[T(U)]_{\Gamma}$ is the tension vector on the boundary of Γ , to conditions of conjugation in Γ : $[U]_{\Gamma^1}^{(1)} = [U]_{\Gamma^1}^{(2)}$ and to a certain condition of radiation at infinity.



EYDUS, D.M.
Principle of limit amplitude. Dokl. AN GSSR 158 nc.4:794-797
O '64. (MIRA 17:11)

1. Rostovskiy gosudarstvennyy universitet. Predstavleno akademikom
V.I. Smirnovym.



SOV/141-1-5-6-21/28

AUTHORS: Tsetlin, M.L. and Eydus, G.S.

TITLE: Algebraic Method of Synthesis of the Circuits Based on

Bistable Trigger Units

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika,

1958, Vol 1, Nr 5-6, pp 166 - 176 (USSR)

ABSTRACT: The algebraic method of synthesis of the so-called non-primitive circuits was described by one of the authors

(M.L. Tsetlin - Ref 2) in an earlier article. Here, the

method is applied to the systems employing bistable

triggers and the theory presented assumes that the reader is familiar with the earlier article. The systems considered are suitable for the processing of the information

which is periodically applied to inputs of the device.

Since the absolute time scale is of no particular importance, it is assumed that the time changes in steps

(0, 1, 2 and so on). It is also assumed that the input signals of the system or its output signals have only

two levels (binary systems). The system has n + s input

bushars x^1 , x^2 , x^{n+s} and x^{n+s} output terminals

Cardl/4 f', f^{p+s} . The system is primitive if the state of

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Algebraic Method of Synthesis of the Circuits Based on Bistable Trigger Units

the output terminals at the instant t is determined by the state of the input terminals at the same instant. For this case, the equation relating the states of the input and output terminals is in the form of:

$$f_{\dot{t}}^{\dot{i}} = f^{\dot{i}}(x_{\dot{t}}^{\dot{i}}, \dots, x_{\dot{t}}^{\dot{n}+s}), \quad \dot{i} = 1, 2, \dots, p+s$$
 (1).

However, Eq (1) is inadequate for the description of real systems which contain parasitic capacitances and inductances, and produce delays between the input and output signals. The delays are disregarded in this work. If the output terminals of the device are connected with the input busbars by means of delay elements (as shown in Figure 1), a non-primitive system with s feedback paths is obtained; the symbol s denotes the number of delay elements. If the states of the input terminals \mathbf{x}^{n+1} at the instant t+1 is denoted by $\phi_{\mathbf{t}}^{\mathbf{i}}$ and the state of the output

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The state of the s

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Algebraic Method of Synthesis of the Circuits Based on Bistable Trigger Units

is ϕ_{t+1}^{i} , the system can be described terminals by Eqs (2). The properties of the equations are analysed in detail and it is shown that an arbitrary equation of a non-primitive system can be realised by means of trigger circuits. The theory is used to design a converter which converts an ordinary binary code into a Grey code. The device is illustrated schematically in Figure 3. A binary difference counter is also designed; the system has two input terminals and its detailed circuit diagram is shown in Figure 5. A reversing ring counter is also designed and its circuit is shown in Figure 6. The circuits of Figures 5 and 6 were tested experimentally. The authors express their gratitude to G.A. Levin for his interest in this work. There are 6 figures and 7 Soviet references; 1 of the references is translated from English.

Card3/4

SOV/141-1-5-6-21/28 Algebraic Method of Synthesis of the Circuits Based on Bistable

Trigger Units

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State

University)

SUBMITTED:

First submitted to the editor of the journal

"Elektrosvyaz'" - January 15. 1958

Submitted to the editor of this journal -

June 23, 1958

Card 4/4

AUTHORS: Tsetlin, M.L. and Eydus, G.S. > S0V/106-58-4-7/16

TITLE: A Matrix Method for Synthesis of Multi-branch, Relaycontact Switching and Control Systems (Matrichnyy metod sinteza mnogotaktnykh releyno-kontaktnykh skhem svyazi

i upravleniya)

PERIODICAL: Elektrosvyaz', 1958, Nr 4, pp 41 - 48 (USSR)

ABSTRACT: The author gives a matrix method of analysis and synthesis of relay-contact switching circuits together with several examples of its application.

A relay-contact system containing s electromagnetic relays ϕ_1, \ldots, ϕ_s , n control elements (push-buttons, switches,

contacts) $X_1, \ldots X_n$ and p output lines f_1, \ldots, f_p is considered. The sequence in which the relays are switched and, consequently, the sequence of application of voltage to the output lines depends on the action of the control elements and is determined by the circuit arrangement. The number 1 is allotted to the energized state of a relay and 0 to the deenergised state. A circuit containing s relays can have, in all 28 states. These states are conveniently written

in the form $\beta_{s}, \ldots, \beta_{l}$, where $\beta_{k}(k = 1, 2, \ldots, s)$ can have

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A Matrix Method for Synthesis of Multi-branch, Relay-contact Switching and Control Systems

a value O or 1. For example, if all the relays are denergised, the state of the circuit can be symbolised by $0, 0, \ldots, 0$ ($\beta_1 = \beta_2 = \ldots = \beta_s = 0$). If the 1st and 3rd relays are energised, the state changes to $0,0,0,\ldots 0,1,0,1$ ($\beta_1 = \beta_3 = 1$, the remaining values equalling O). All the states are numbered $0,1\ldots,2^{8}-1$ and the state numbered k is written in binary form β_s,\ldots,β_1 , the commas indicating that this is a binary number and not a product. Let the circuit at some instant of time be in the state k. Due to the action of the control elements (push buttons) the state changes to the l^{th} state ($l = 0, 1, \ldots, l^{2}-1$). This action can be represented as some function of the variables l^{th} state to the l^{th} state occurs always, and only, when the values of the variables l^{th} state occurs always, and only, when the values of the variables l^{th} state occurs always, and only, when the values of the variables l^{th} state occurs always, are such that l^{th} state to the l^{th} state occurs always, and only, when the values of the variables l^{th} state l^{th} state occurs always, and only, when the values of the variables l^{th} state l^{th} state occurs always, and only, when the values of the variables l^{th} state occurs always, and only, when the values of the variables l^{th} state occurs always, and only, when the values of the variables l^{th} state occurs always, and only, when the values of the variables l^{th} state occurs always, and only, when the corresponding change-over

A Matrix Method for Synthesis of Multi-branch, Relay-contact Switching and Control Systems

cannot occur.
The values ak1 are written in matrix form:

$$A \begin{pmatrix} a_{0;0} & a_{0;1} & \cdots & a_{0;2s-1} \\ \cdots & \cdots & \cdots & \cdots \\ a_{2s-1;0} & a_{2s-1;1} & \cdots & a_{2s-1;2s-1} \end{pmatrix}$$
 (1)

Then the condition for change-over from the k^{th} to the l^{th} state, denoted by $a_{k,l}$ (x_1, \ldots, x_n) is located at the intersection of the k^{th} line with the l^{th} column. The elements $a_{s}, \ldots, a_{l}; \beta_{s}, \ldots, \beta_{l}^{(x_1)}, \ldots, \alpha_{n}$ are functions of the control elements X_1, \ldots, X_n . The letter x_i represents contacts which are closed when the button x_{l} is pressed and opened when it is released. Similarly,

A Matrix Method for Synthesis of Multi-branch, Relay-contact Switching and Control Systems

 $\overline{\mathbf{x_i}}$ represents contacts which are open when the button X_i is pressed and closed when it is released. Closed contacts are represented by 1, and open contacts by 0. Thus, if button X_i is pressed, $x_i = 1$, $\overline{x_i} = 0$; if X_i is released, $x_i = 0$, $\overline{x_i} = 1$.

Functions $a_{\alpha_s,...,\alpha_1}$; $\beta_s,...,\beta_1(x_1,...,x_n)$ are formed from the values $x_1,...,x_n$ by the basic operations:

logical addition, multiplication and negation (Ref 5). For example, if, initially, all the relays are disconnected and to switch in the sth relay only, it is necessary to press buttons \mathbf{X}_1 and \mathbf{X}_2 and not to press \mathbf{X}_3 , then:

$$a_{0,0}, \ldots, 0; 1,0,0,\ldots, 0 = (x_1, x_2, x_3) = (x_1) = (x_1)$$

where \forall denotes the logical summation.

It can be proven (Refs 9, 10) that the matrix of the states

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A Matrix Method for Synthesis of Multi-branch, Relay-contact Switching and Control Systems

of relay-contact systems satisfies the following conditions:

1) The logical sum of the elements of any line equals 1:

$$\bigvee_{l} a_{k;l} = \bigvee_{\beta_{8}, \ldots, \beta_{1}} a_{\alpha_{8}, \ldots, \beta_{1}} \alpha_{1}; \beta_{8}, \ldots, \beta_{1}^{(x_{1}, \ldots, x_{n})} = 1$$
(2)

2) The product of elements in different columns of one line equals 0:

$$a_{k; l_1} a_{k; l_2} = 0; l_1 + l_2$$
 (3)

Such matrices are called "simple" matrices. On the circuits, the letter ϕ_i denotes the winding of the ith relay, ϕ_i - the closed contacts and $\overline{\phi_i}$ - the open contacts, when the relay is switched into circuit. Closed contacts are represented by 1 and open contacts by 0. The presence or absence of voltage on the winding of the relay ϕ_i is denoted by the value of ϕ_i (ϕ_i = 1 or Card5/9

SOV/106-58-4-7/16 A Matrix Method for Synthesis of Multi-branch, Relay-contact Switching and Control Systems

 ϕ_i = 0, respectively). If the voltage is applied to the relay ϕ_i but its contacts have not changed over, then ϕ_i = 1; ϕ_i = 0; $\overline{\phi_i}$ = 1. After an interval of time necessary for operation of the relay, the contacts change over and then ϕ_i = 1; ϕ_i = 1; $\overline{\phi_i}$ = 0. (The values ϕ_i , $\overline{\phi_i}$, x_i , $\overline{x_i}$, ϕ_i depend on time and in Refs 9, 10, this is accounted for by an additional index t. For simplicity, this is not used in this work.)

The conditions for switching in the i relay are functions of the states of the control elements and the circuit relay contacts and are written in the form:

$$\phi_i = \phi_i (x_1, \ldots, x_n; \varphi_1, \ldots, \varphi_s)$$
 (4)

From Eq.(4), a single-valued matrix of the circuit states is established, i.e. the matrix elements ${}^a\alpha_s, \ldots, \alpha_1; \ \beta_s, \ldots, \beta_1 (x_1, \ldots, x_n)$ are found by the

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formula:

$$a_{\alpha_{s},...,\alpha_{1};\beta_{s},...,\beta_{1}}(x_{1},...,x_{n}) = \prod_{i=1}^{s} (\alpha_{i}(x_{1},...,x_{n};\alpha_{1},...,\alpha_{s}))$$
(5)

Thus, to find the element $a_{\alpha_8}, \dots, \alpha_1; \beta_s, \dots \beta_1$ it is necessary to form the logical product from expressions of the type (4), replace ϕ_i by α_i and take the logical negation in those cases where $\beta_i = 0$. If the circuit has output lines f_1, \dots, f_p , then the presence of voltage on the ith line is also a function of the state of the control elements and relay contacts, which can be presented in the form:

$$f_i = f_i(x_1, \dots, x_n; \varphi_1, \dots, \varphi_s)$$
 (6).

The application of the above method is demonstrated by the analysis of an example circuit.

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A Matrix Method for Synthesis of Multi-branch, Relay-contact Switching and Control Systems

The author next considers the synthesis of relay-contact systems, i.e. obtains a circuit which will meet given requirements. Insofar as the states matrix completely describes the circuit operation, the problem of synthesis of the circuit consists of finding the states matrix by which the relay switching functions (of the Eq.(4) type) are determined and hence the circuit itself is determined. For any simple matrix:

$$A = \|a_{\alpha_{s}, \dots, \alpha_{1}; \beta_{s}, \dots, \beta_{1}}(x_{1}, \dots, x_{n})\|$$

a single value circuit can be established and the switching function of the ith relay can be obtained by the relationship:

$$\phi_{\mathbf{i}}(\mathbf{x}_{1},...,\mathbf{x}_{n};\varphi_{1},...,\varphi_{s}) = \sqrt{a_{\alpha_{s}},...,\alpha_{1};\beta_{s}},...,\beta_{1}}(\mathbf{x}_{1},...,\mathbf{x}_{n})[$$

$$\alpha_{s},...,\alpha_{1};\beta_{s},...,\alpha_{1};\beta_{s},...,\beta_{1};\beta_{1}=1$$

$$\alpha_{s},...,\alpha_{1};\beta_{s},...,\alpha_{1};\beta_{s},...,\beta_{1};\beta_{1}=1$$

$$\alpha_{s},...,\alpha_{1};\beta_{s},...,\alpha_{1};\beta_{s},...,\beta_{1};\beta_{1}=1$$

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SOV/106-58-4-7/16 A Matrix Method for Synthesis of Multi-branch, Relay-contact Switching and Control Systems

in which:

$$\left[\varphi_{\underline{i}}\right]^{1} = \varphi_{\underline{i}}, \quad \left[\varphi_{\underline{i}}\right]^{0} = \overline{\varphi_{\underline{i}}}$$
 (14)

Application of the method is demonstrated by synthesis of an example circuit.

There are 4 figures and 11 references, of which 9 are Soviet and 2 English.

SUBMITTED:

July 10, 1957

Card 9/9

1. Switching circuits—Mathematical analysis 2. Control systems—Mathematical analysis 3. Relays—Applications

ZIN'KOVSKIY, Abram Isaakovich; EYIUS, G.S., red.

[Radio engineering experiments] Radiotekhnicheskii
eksperiment. Moskva, Izd-vo "Energiia," 1964. 118 p.
(MIRA 18:2)

EYDUS, G.S.; MARKOV, V.V.; VENEDIKTOV, M.D.

Asynchronous address communication systems; a survey.
Probl. pered. inform. 1 no.413-19 '65.

(MIRA 18:12)

1. Submitted May 18, 1965.

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041231(

"APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00041231

FD-3343

USSR/Physics - Single Crystal Properties

Pub. 146-15/23

Eyous, I.M.

Author

: Stepanov A. V. and Eydus I. M.

Title

: Relation of Elasticity constants of single crystals of sodium chloride

and silver chloride to temperature

Periodical

: Zhur. Eksp. i Teor. Fiz., 29, No 5, 669-675, 1955

Abstract

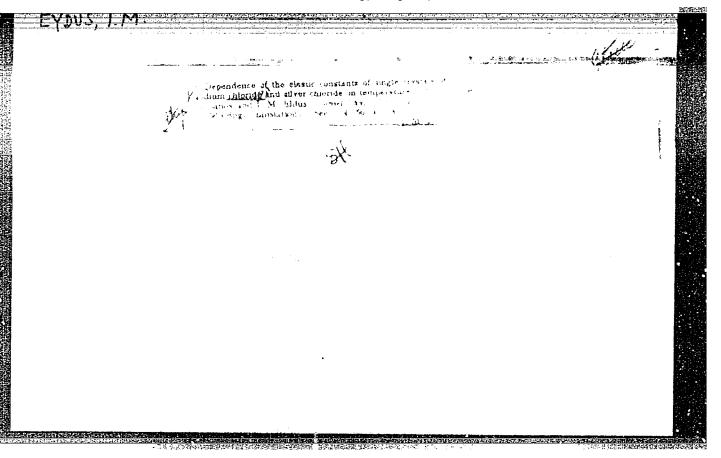
: Research, started in previous works by A. V. Stepanov (Sow. Phys. 6, 312, 1934; ibid. 8, 25, 1935; Zhur. Tekh. Fiz., 19, 205, 1949; ZhETF 25, 98, 1953) is continued. Results of determinations of elasticity constants of single crystals of sodium chloride and of silver chloride are tabulated in a temperature range from room temperature to the melting point. Indebted to Ye. M. Yevstaf'yev, and A. L. Shakh-Budagov for discussions. Thirteen references, including

five foreign.

Institution : Leningrad Physico-Technical Institute, Acad. Sci. USSR

Submitted

: March 26, 1953



EYDUS . T.R.

Neurinoma of the external ear. Vest. otorinolar., Moskva 15 no.2:86 Mar-Apr 1953. (CIML 24:3)

1. Of the Department for Diseases of the Ear, throat, and Mose (Head - Prof. M. A. Karpov), Leningrad Medical Stomatological Institute.

Influence of radiotherapy on the healing of surgical wounds following laryngectomy. Zhur. ush., nos. i gorl. bol. 20 no. 3:38-41 My-Je '60. (MIRA 14:4)

1. Iz otorinolaringologicheskogo otdeleniya (zav. - prof. N.A. Karpov) Instituta onkologii AMN SSSR.

(LARYNX—CANCER) (RADIOTHERAPY)

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17.2400

Eydus, L. Kh. and Kayushin, L. P.

TITLE:

AUTHORS:

Lasting Conservation of Unpaired Electrons in Macromolecules

Upon Irradiation of Proteic Solutions

PERIODICA L:

Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 6,

pp. 1525-1527

TEXT: The authors have applied the method of electron paramagnetic resonance (e.p.r.) to prove the ability of protein molecules (myosin and pepsin, which have quite different properties in many respects) to conserve unpaired electrons in aqueous solutions for a long time. Myosin was extracted by Lyubimova's method (not described in the text) from rabbit muscles (concentration: 10 mg/ml) and irradiated with a Co⁶⁰ gamma dose of 0.5·10⁶ r in a 0.5 m KCl solution. Pepsin was irradiated by Nortrop's (Northrop) method as modified by G. A. Levdikova (Ref. 13) with a dose of 3·10⁶ r in 0.2 m acetate buffer (concentration: 5 mg/ml) at pH 4.8. The radiation doses corresponded to a loss in the activity of ferments of

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Lasting Conservation of Unpaired Electrons in Macromolecules Upon Irradiation of Proteic Solutions

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about 80%. The irradiated solutions were dried out and pulverized. The e.p.r. was measured by a radiospectrometer with a double modification of the magnetic field (upper modulation frequency 465 kc/sec). The first derivatives of the absorption lines were recorded by an on -09 (EPP-09) self-recorder. Fig. 1 shows the measurement results. The e.p.r. spectra of the two irradiated substances constitute singlet signals. Their factor of spectroscopic splitting approaches the g-factor of 1,1-diphenyl picryl hydrazine. The distance between points of maximum inclination is 14.5 gauss in myosin, and 17.5 gauss in pepsin. Such signals were not observed in the control preparations. The same ferment solutions were incubated in a warm ambient prior to drying after irradiation (myosin 24 h at 20°C, pepsin 6 h at 54°C). According to results supplied by an earlier paper, the "thermal" after-effect of irradiation is observed with such an incubation, as a part of the protein with hidden damage loses its fermentative activity. The incubation process was complete, and the remaining degree of activity was therefore no more altered by additional incubation. It was observed from curves A, b, and B, b (Fig. 1) that no more unpaired electrons could be proved to exist after the mentioned

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Lasting Conservation of Unpaired Electrons in Macromolecules Upon Irradiation of Proteic Solutions

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inactivation in the proteins. The same conservation of unpaired electrons was established with the photodynamic effect. The duration of exposure with visible light (2 bulbs 300 watts each) corresponded to about the loss of half the ferment activity. Results are shown in Fig. 2. No similar e.p.r. signals were observed in the control preparation. The authors conclude that their results confute the principal objection against the hypothesis of an "after-effect" of radiation damage, namely, the unlikeliness of the appearance of unpaired electrons in diluted proteic solutions. G. K. Otarova and M. K. Pulatova are thanked for their assistance. There are 2 figures and 13 references: 10 Soviet, 2 US, and 1 British.

ASSOCIATION: Institut biologicheskoy fiziki Akademii nauk SSSR (Institute

of Biophysics of the Academy of Sciences USSR)

PRESENTED: October 5, 1960, by N. M. Sisakyan, Academician

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SUBMITTED: September 16, 1960

Card 3/3

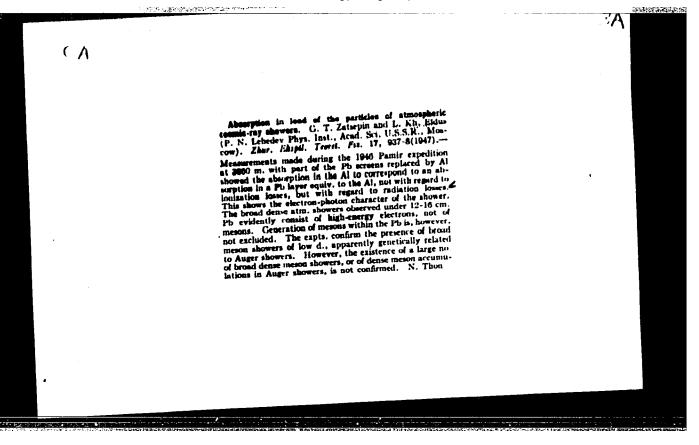
EYDUS, M.S.

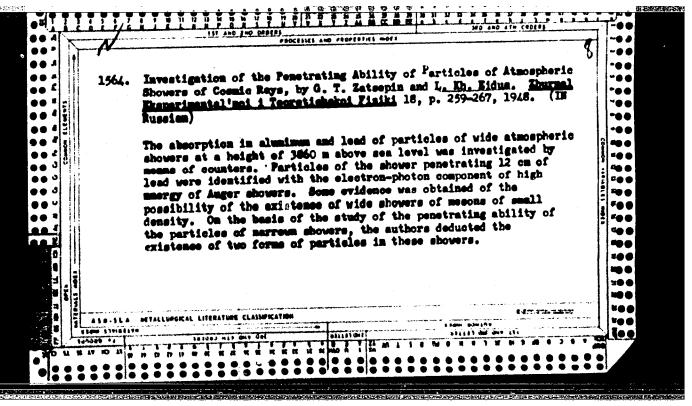
XEIDUS, M.S., ADAMOVICH, M.I., IVANOVSKAYA, I.A., NIKOLAYEV, V.S., TULY":INA, M.S.

Cosmic Rays

Spatial distribution of penetrating particles in atmospheric showers of cosmic rays. Zhur. eksp. i teor. fiz. 22 no. 4, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 195, Uncl.





ETDUS, L. KH.

Birger, N. G., Veksler, V.I., Dobroshin, N.A., Zatsepin, C.T., Kurnosovs, L. B., Linbimov, A.L., Rozental, I.A., and <u>Eidus, L. Kh.</u> P. 826

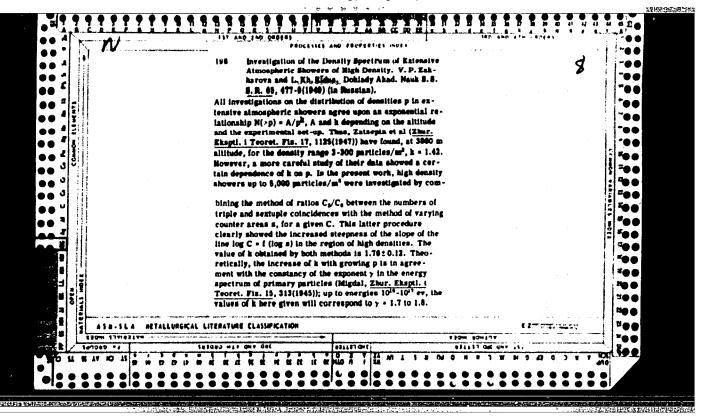
The main results of a series of experiments (in which electron nuclear showers were discovered and investigated) which the authors have been working on for a number of years are presented. The electron nuclear showers originated at nuclear interactions of very high energies (from 10 eV and above) and also from the nuclear-cascade process in cosmic rays. These two phenomena make it possible to explain basically the whole picture of processes occurring in cosmic rays.

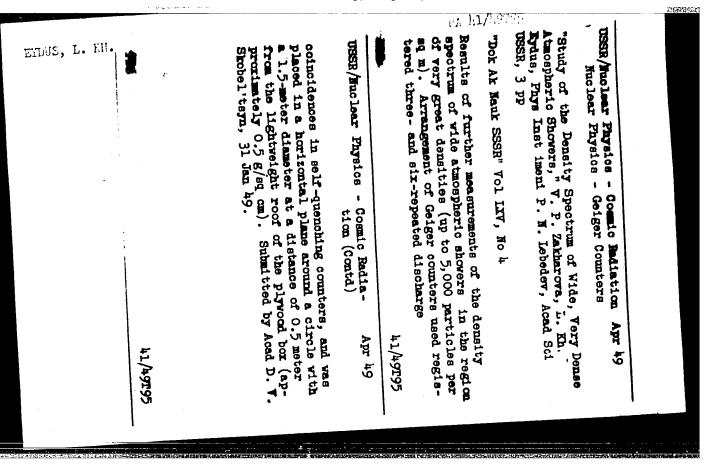
The 1. N. Leiedev Inst. of Physics, Acad. of Sci., USSR May 23, 1949

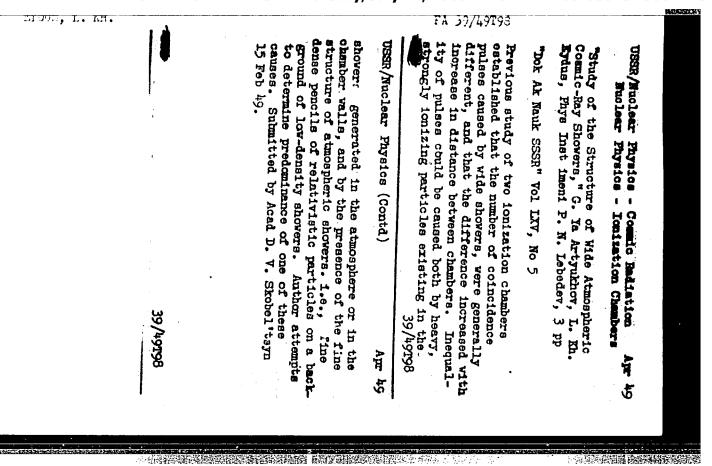
SO: Journal of Experimental and Theoretical Physics, (USSR) 19, No. 9 (1949)

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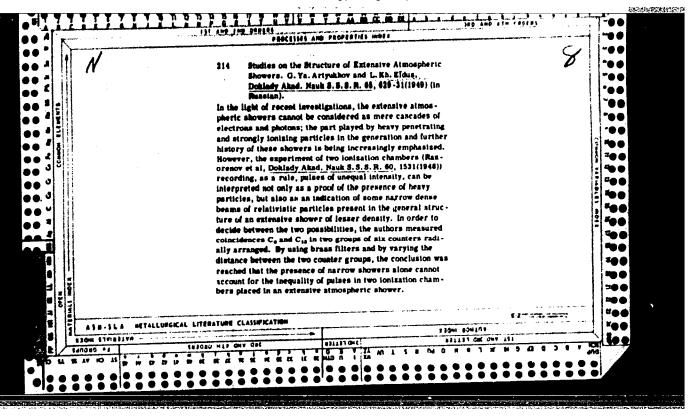






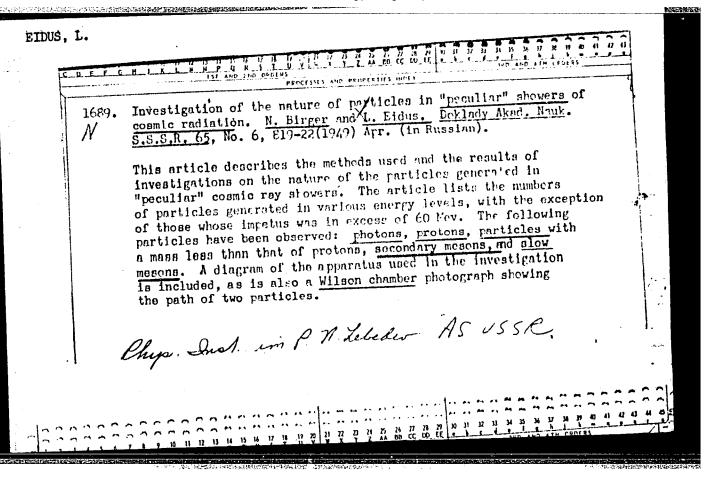
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"APPROVED FOR RELEASE: Thursday, July 27, 2000

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"APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00041231

EYDUS, L. KH.

USSR/Nuclear Physics - Radiation

21 Sep 49

Cosmic electron-photon Component

"Formation of High-Energy Electrons and Photons in the Lower Atmospheric Strata by Cosmic Radiation," Ya. G. Artukhov, G. T. Zatzepin, L. E. Sarycheva, L. Kh. Eydus, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, 34 pp

"Dok Ak Nauk SSSR" Vol LXVIII, No J

Describes study of high-energy electron-photon component conducted in summer 1948 on the Pamirs. According to experimentally confirmed hypothesis, secondary nuclear-active particles are formed when special showers are generated, causing a nucleocascade process. Fundamental significance of this process must be admitted not only in development of wide showers but also in formation of high-energy electron-photon component in lower strata of atmosphere.

Submitted by Acad D. V. Skobel tsyn 22 Jul 49

PA 149T78

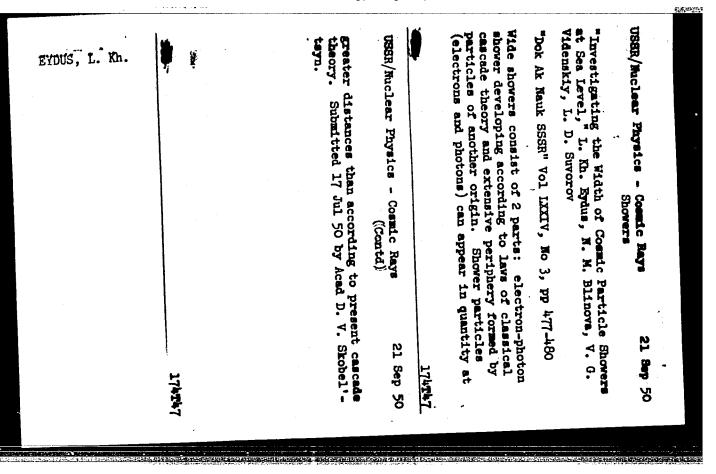
EYDUS, L. KH.

3227. On the generation of a high-energy electron photon component. G. Ya. Artyukhov, G. T. Satespin, L. I. Sarycheva and L. KH. Eipus Doki. Akad. Nauk, S S SR, 69 (No. 2) 153-6 (1949) In Russian.

The narrow structure of showers observed when high-energy electrons and photons are emitted is explained by the formation of special showers in the atmosphere; the occurrence of photon showers suggests that photons are present in special showers which become converted into electrons during the passage through the atmosphere. Electrons of enerfy 2-3x109 eV were observed. A close connection is established between the electron-photon component and penetrating and nuclear active particles; this agrees with the view that nuclear active particles, which are responsible for the formation of this component at great depth of the atmosphere, are secondary particles.

J. Jacobs

Phys Ind in delader



EIDUS, L. Kh.

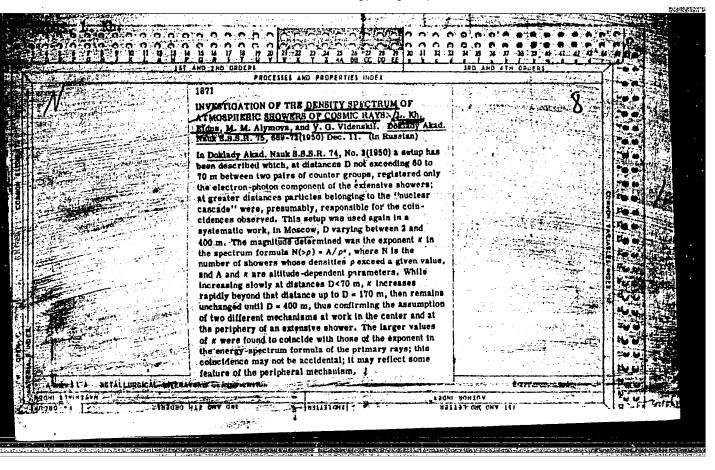
1868

DISINTEGRATION OF PARTICLES GENERATING ELECTRON-NUCLEAR SHOWERS.

M. I. Podgoretskii, A. L. Lubimov, M. N. Shcherbakova, and L. Kh.
Eidus. Doklady Akad. Nauk. S.S.S.R. 75, 15-17(1950) Nov. 1. (In
Russian)

Several recent high-mountain experiments made by various workers in the Pamir pinted to the existence of unstable particles in the component generating electron-nuclear showers. The method consisted generally in comparing coincidence numbers counted at different altitudes, using dense filters to compensate for the altitude difference. It is pointed out that, although data so obtained can also be interpreted as due to a density transition effect, such an interpretation is not generally true, the criterion being the sign of the transition effect. This criterion is applied in an analysis of some of the setups used in the experiments, and applied in an analysis of some of the setups used in the experiments, and the presence of disintegrating particles in the showers under consideration is established. These particles are hardly u mesons; they are probably mesons having different equilibrium intensities in air and in dense matter.

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R000412310

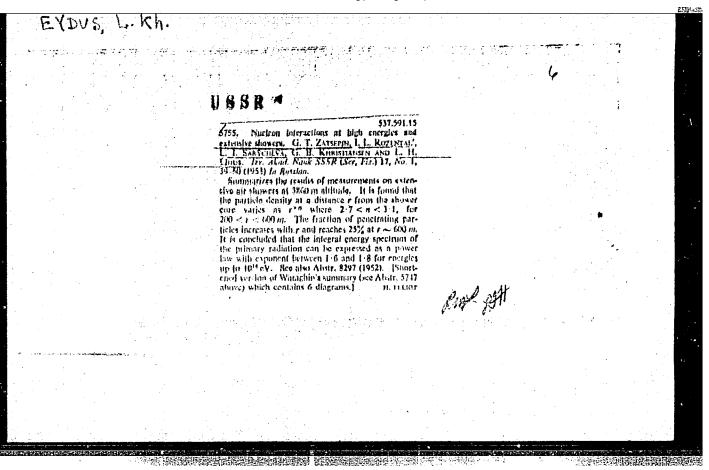


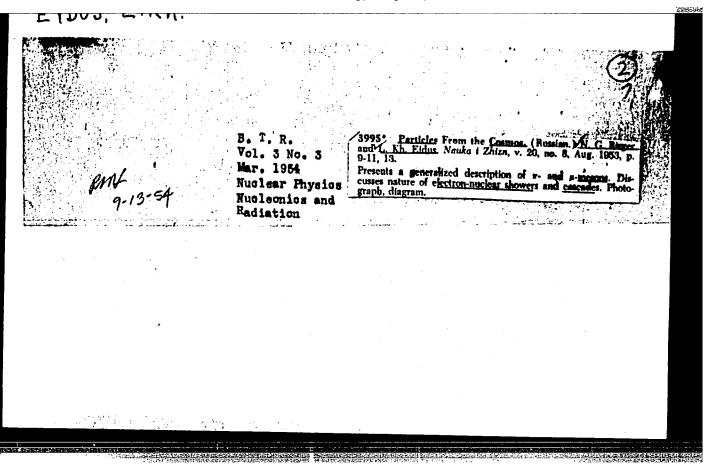
EYDUS, L. KH.	USSR/Physics - Commic Rays, Wide At- mospheric Showers "Concerning the Nature and Mechanism of the For- mation of Particles of Wide Atmospheric Showers in mation Rays," L. Kh. Eydus, Phys Inst imeni Le- Cosmic Rays," L. Kh. Eydus, Phys Inst imeni Le- bedev, Acad Sci USSR "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Vol LXXXI, No 6, pp 1035-1038 "Dok Ak Nauk SSSR" Law
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04558	
USSR/Physics - Commic Rays	Apr 52
"Spatial Distribution of Atmospheric Showers of Co M. I. Adamovich, I. A. Iv M. S. Tulyankina, Phys In Sci USSR	n of Penetrating Particles in of Cosmic Rays," L. Kh. Eydus, A. Ivanovskaya, V. S. Nikolayev, ays Inst imeni Lebedev, Acad
"Zhur Eksper 1 Teoret Fiz" 447	Vol XXII, No 4, pp 440-
Investigates the spatial particles in atm showers nected to hodoscopes. Showerstating particles inc	al distribution of penetrating rs by means of counters con- Shows that the percent of increases proportionally to the
	21 5181
distance to the shower's axis penetrating particles exceeds energy of the shower. Preser of showers with a complex spedented to Acad D. V. Skobelt: G. T. Zatsepin. Received 15	the shower's axis. The total energy of particles exceeds half of the total he shower. Presents proofs of existence with a complex spatial structure. Incad D. V. Skobeltsyn, N. A. Dobrotin, pin. Received 15 Dec 51.
EYDUS, L. KH.	ध्य प्रहो

Epple, E. Kh. -- "An investigation of the properties of Entensive At asymmetic Enowers of Cos de Hadiation." Cand Physicath Sei, Physica 1.5t, Acad Sei 155m, Loseow 1953. (Referativnyy Zhurnal--Fizika, Jan Sh)

S0: St. 163, 22 July 195h

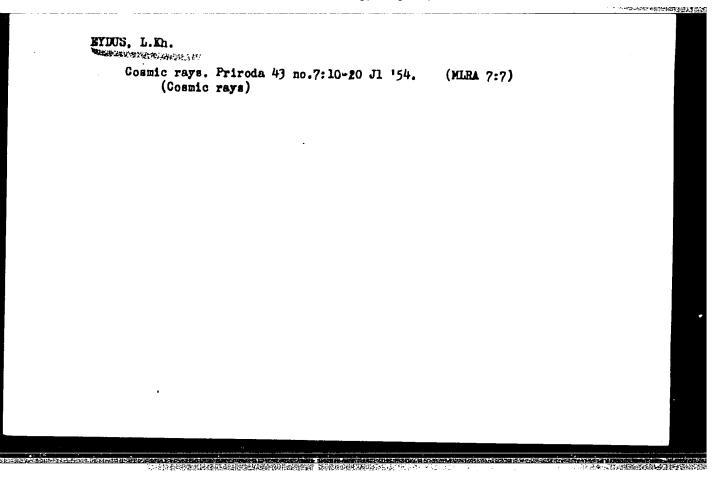




and KHRISTIANISM, G. B.

"Wide Atmospheric Showers of Cosmic Rays," Usp. Fiz. Nauk SSSR, 49, No. 2,

Translation DSI Trans. No. 31, Jan 1954.



"APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00041231

USSR/Chemistry - Biochemistry

Card 1/1 Pub. 22 - 22/40

Authors

* Kuzin, A.M., and Eydus, L. KH.

Title

Deuteration of acetone in the presence of amino acids

Periodical

Dok. AN SSSR 99/3, 421-422, Nov 21, 1954

Abstract

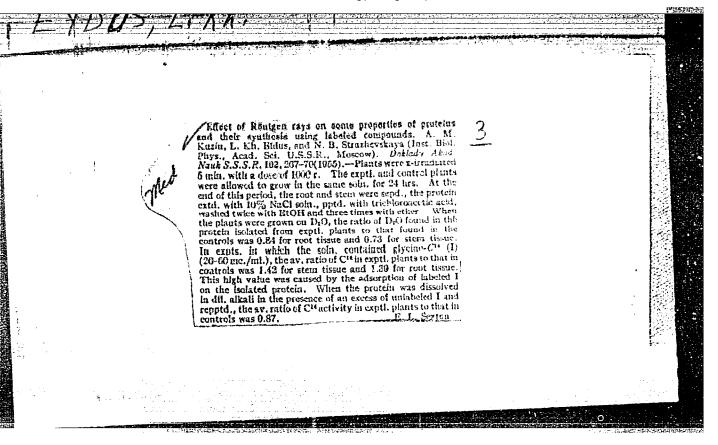
The rate of penetration of deuterium into the acetone molecule and the effect of amino acid - glycocoll - on the process of acetone deuteration, were investigated. The rate of acetone deuteration in the absence of glycocoll was found to be low, and less than 1% of the total number of bydrogen atoms in the acetone underwent a change. The accelerating effect of glycocoll was proven. The formation of an enol form in the acetone under the effect of glycocoll was established. Seven references: 5-USSR and 2-German (1934-1951). Table; graph.

Institution : Academy of Sciences USSR, Institute of Biophysics

Presented by : Academician A.I. Oparin, September 11, 1954

"APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00041231



WIISON, J.G., editor; EYDUS, L.Kh. [translator]; GUROV, K.P., redaktor; NIKIFOROVA, A.N., tekhnicheskiy redaktor

[Progress in cosmic ray physics. Translated from the English] Fizika kosmicheskikh luchei; sovremennye dostizhenia. Sostavleno gruppoi avtorov, pod red. Dzh.Vil'sona. Perevod s angliiskogo L.Kh.Eidusa. Moskva, Izd-vo inostrannoi lit-ry, Vol.2. 1956. 279 p. (MIRA 9:11) (Cosmic rays)

EYDUS, L. KH.

"On the Primary Mechanism of the Biological Action of Radiation," by L. Kh. Eydus, Institute of Biological Physics, Academy of Sciences USSR, Moscow, Biofizika, Vol 1, No 6, 1956, pp 544-554

The author attempts to explain certain experimentally observed characteristics of the effect of radiation on living organisms, based on given concepts of the primary mechanism of the action of radiation.

It has been established that ionizing radiation exerts both a direct effect on macromolecules and an indirect effect (by means of the products resulting from the radiolysis of fluid in which are found biologically important molecules of proteins, nucleic acids, etc.). The existence of proteins of energy, absorbed by an organism on irradiation, prolonged conservation of energy, absorbed by an organism on irradiation, permits more accurate definition of the concept of "primary" and "secondary" effects. The primary process is the process of absorption of the radiant energy by the organism and subsequent utilization of this energy for the breakdown of the chemical bonds in the organism, as a result of which the microstructure of the organism is disrupted. This disturbance results in edistrubance of the metabolism related to this structure, i.e., it produces a distrubance of the metabolism related to this structure, i.e., it produces secondary processes. The fractional amount of the absorbed energy which acts directly depends on the organism. The appearance of the conserved portion of the energy is strongly dependent on temperature. This has been observed in experiments where the organism was incubated after irradiation.

Approximately one third of the 47 references listed are Soviet. (U)

54M.1374

BOLGARINA, V.P.; MYDUS, L.Kh.

Radiation mehtod for determining the green bulk of standing plants. Biofizika 1 no.7:653-656 156.

1. Institut biologicheskoy fiziki Akademii nauk SSSR, Moskva. (PHOSPHORUS--ISOTOPES) (PLANTS, REFERCT OF RADIATION ON)

5 ARIS 1970, MANT (1982)	March T. B. C. M. C. Server, G. S		SELDEREN
EYDUS, L.Kh.			
	andanasa Rajirata		
h	Movement of nutrient substances in the plant. A. M. Kuzin, V. I. Merenova, and L. Kh. Eldus (Biophys. Inst., Moscow). Fisiol. Ratients 3, 121-4(1956).—Tests with kidney-bean plants utilizing D ₂ O (20% soin, for root immersion), and C ¹ -labeled AcONa (labeled in CO ₃ ti group) showed that the C ¹ enters rapidly the leaves of the plant under conditions of illumination, as does the D ₂ O. Darkness regards this movement. G. M. Kosolapoff.	<u>3</u>	
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Migration mechanism of protection against radiation effects.

Migration mechanism of protection against radiation effects.

Biofisika 2 no.51573-580 '57. (MIRA 10:11)

1. Institut biologicheskoy fisiki AN SSSR, Moskva.

(XRAYS—PHYSIOLOGICAL EFFECT) (PROTRINS)

EYDUS, L.Kh., prof., otvetstvennyy red.; LIVSHITS, N.N., red.; SHAPIRO, F.B., red.; ETDUS, L.Kh., red.; IOFFE, V.G., red.izd-va; POLYAKOVA, T.V., tekhn.red.

[Radiobiology; proceedings of a conference] Radiobiologiia; trudy konferentaii. Moskva, Izd-vo Akad. nauk SSSR, 1958. 286 p. (MIRA 11:5)

1. Vaesoyuxnaya nauchno-tekhnicheskaya konferentsiya po primeneniyu radioektivnykh i stabil'nykh izotopov i izlucheniy v narodnom khozyaystve i nauke, 1957. 2. Institut biofiziki AN SSSR (for Kurin)

(RADIATION-PHYSIOLOGICAL EFFECT)

: USSR COUNTRY В : General Biology. CATEGORY Physical and Chemical Biology. RZhBiol., No. 5, 1959, No. 18963 ABS. JOUR. Lydus, L. Kh.; Kondakova, H.V.; Oterova, G. K. AUTHOR The Mechanism of the "Oxygen Effect" in INST. TITLE Radiobiology. : Biofizika, 1958, 3, No 2, 215-219 ORIG. PUB. : It was shown that in a h mg/ml concentration, a myocin (I) solution which was freed from air ABSTRACT and subjected to an X-ray irradiation of 50,000 r in vacuum cuvettes, almost completely preserved its ATP (adenosine triphosphate) activity which may also be determined in anaerobic conditions by incubation with ATP, while irradiation with the very same dosage in aerobic condition leads to a 48 percent inactivation of I. After gir is admitted into cuvettes which contain the irradiated solution, 1/3 Card:

EYDUS, L.Kh., KONDAKOVA, N.V.

Mechanism of photodynamic effects. Biofizika 3 no.5:562-567 '58

(MIRA 11:10)

1. Institut biologicheskoy fiziki AN SSSR, Moskva

(LICHT, effects, photodynamic eff. on biol. objects in presence of stein (Rus))

AUTHORS:

Medvedeva, G. B., Eydus, L. Kh.

20-118-5-54/59

TITLE:

Marked Atoms, as Applied for Investigating the Fertilization

Process in Plants

(Primeneniya mechanykh atomov k izuchaniyu protsessa oplodot=

voreniya u rasteniy)

PERIODICAL:

Doklady Akademii Nauk SSSR, 1958, Vol. 118, Nr 5, pp.

1037-1039 (USSR).

و الله والسحواراوم

ABSTRACT:

It was proved in the course of the last years that the number of the pollen tubes growing through the pistil do not at all represent a "guarantee fund" which has to guarantee success to one single tube. These "excess" tubes are included in com= plicated metabolic processes and play a certain and not at all unimportant role in fertilization. Thus, the fertilization process is not restricted to the union of male and female gametes. The quantity of pollen participating in pollination has proved to be a most important factor which guarantees not only normal budding of the seeds but also high viability of their offspring. (references 1 - 3). The problem of the influence of the quantity of pollen on hereditary marks of the offspring was less clear.

Card 1/4

Marked Atoms, as Applied for Investigating the Feritilization Process in Plants

20-118-5-54/59-

However, an increased paternal influence had to be excepted in the case of a greater quantity of pollen tubes. The authors hade made it their object to determine the dependence of the distinct= ness of the paternal characteristics in the case of the hybrids of the first generation on the quantity of substance of the pollen tubes which have reached the embryo sac. For this purpose corn was used (paternal species - yellow seeds, maternal species - white seeds). The substance of the pollen tubes contained in the hybrid seeds of different color was to be determined quantitatively. For the solution of this problem the method (according to reference 5) of the saturation of the pollen with radioactive sulfur isotope (S3) was used. Moreover, the spikes isolated before were pollinated with this radioactive pollen and radioactivity of ripe hybrid seeds divided into fractions according th the color intensity of their endosperm was recorded. The higher radioactivity of the glaring yellow fractions compared to the white or pale colored might serve as an index of direct dependence of the quantity of paternal substance on the degree of the distinctness of the pater= nal characteristics. The experiments comprised two growing seasons: 1955 and 1956. The panicles of the paternal species were

Card 2/4

Marked Atoms, as Applied for Investigating the Fertilization Process in Plants

20-118-5-54/59

plunged in parchment parcels into a solution of radioactive materials (in 1955 Na₂SO₁, in 1956 methionine). The pollen

was used for pollination after each portion had been investi= gated as to radioactivity. The radioactivity was computed per one pollen grain. The radioactivity of the seeds was determined by their ashing and then computed per 1 seed. This made possible an approximated determination of the number of pollen grains has ving participated in the fertilization of a corn seed. It can be seen from table 1 that within every spike yellow seeds were much less radioactive than the white seeds. This holds also for the computation of the differently colored seeds per 1 g of their dry weight. Concentration of radioactivity was equal in the embryo and the endosperm while it was by 40% weaker in the shells. The method of the marked atoms made possible the determination of the direct dependence of the number of the pollen tubes which have entered the embryo sac and the distinstness of the paternal characteristics of the coloring of the seeds of the first generas tion. The yellow color of the endosperm due to the paternal producer dominates only in the case of a sufficient quantity of pollen

Card 3/4

SHCHEPOT'YEVA, Ye.S.; ARDASHNIKOV, S.N.; LUR'YE, G.Ye.; RAKHMANOVA, T.B.; EYDUS, L.Kh., red.; ZUYEVA, N.K., tekhn.red.

[Oxygen effect in the action of ionizing radiations] Kislorodnyi effekt pri deistvii ioniziruiushchikh izluchenii. Moskva, Gos. izd-vo med.lit-ry, Medgiz, 1959. 184 p. (MIRA 12:12) (RADIATION--PHYSIOLOGICAL EFFECT) (OXYGEN)

EYDUS, L.Kh.; GANASSI, Ye.E.

Studies on the mechanism of radiation "aftereffect" in proteins
[with summary in English]. Biofizika 4 no.2:215-223 '59.

(MIRA 12:4)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.

(MUSCLE PROTEINS,

myosin solution, after-eff. of x-irradiation (Rus))

(ROENTOEN RAYS, effects,

on myosin solution, after-eff. (Rus))

After effect of photodynamic action. Biofizika, 4 no.3:378-379 '59.

(MIRA 12:7)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.

(RADIATIONS, eff.

after eff. in photodynamic eff. (Rhs))

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BYDUS, L.Kh.; OTAROVA, G.K.

The existence of certain ensymatically active conditions of myosin with various degrees of heat sensitivity. Biokhimiia 24 no.6:982-992 N-D *59. (MIRA 13:5)

1. Institute of Biological Physics, Academy of Sciences of the U.S.S.R., Moscow.

(MUSCLE PROTEINS chem.)

PHASE I BOOK EXPLOITATION SOV/5628

Akademiya nauk SSSR. Institut biologicheskoy fiziki

Rol' perekisey i kisloroda v nachal'nykh stadiyakh radiobiologicheskogo effekta (Role of feroxides and Oxygen During Prinary Stages of Radiobiological Effects) Moscow, 1960. 157 p. 4,500 copies printed.

Responsible Ed.: A. M. Kuzin, Professor; Ed. of Publishing House:
K. S. Trincher; Tech. Ed.: P. S. Kashina.

PURPOSE: This collection of articles is intended for scientists in radiobiology and biophysics.

COVERAGE: Reports in the collection deal with the role of peroxides and oxygen in the primary stages of a radiobiological effect. They were presented and discussed at a symposium held December 25-30, 1958, organized by the Institut biofiziki AN SSSR, (Institute of Biophysics, AS USSR). Twenty-eight Moscow scientists, radiobiologists, radiochemists, physicists, and

Card-1/5-

Role of Peroxides and Oxygen (Cont.)

SOV/5628

physical chemists took an active part in the symposium. Between the time of its conclusion and the publication of the present book some of the materials were expanded. In addition to the authors the following scientists participated in the discussion:

L. A. Tummerman, V. S. Tongur, G. M. Frank, Yu. A. Kriger, E. Ya. Grayevskiy, N. N. Demin, E. N. Tarusov, and I. V. Vereshohenskiy. References follow individual articles.

TABLE OF CONTENTS:

Kuzin, A. M. [Institut biologicheskoy fiziki AN SSSR - Institute of Biophysics, AS USSR]. Role of Formation of Peroxides During the Action of Radiation on Biological Specimens

Bakh, N. A. [Institut elektrokhimii AN SSSR - Institute of Electrochemistry, AS USSR]. Formation of Organic Peroxides Under the Action of Radiation

Dolin, P. I. [Institute of Electrochemistry, AS USSR]. Lifetime of Intermediate States Arising During the Action of Radiation on Aqueous, Solutions

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	Role of Peroxides and Oxygen (Cont.) SOV/5628				
•	Electron Paramagnetic Resonance Method	99			
	El'piner, I. Ye, and A. V. Sokol'skaya [Institute of Bio- physics, AS USSR]. Effect of Inert Gases on Oxidation Pro- cesses in an Ultrasound-Wave Field	105	•	: !	6 . *
· •	Shekhtman, Ya. L. [Institute of Biophysics, AS USSR]. Oxygen and the Theory of Primary Radiobiological Effect	116	•		•
	Eydus, L. Kh. [Institute of Biophysics, AS USSR]. Phenomenon of Oxygen Aftereffect in Radiobiology	136		` i	
1	Ardashnikov, S. N. Certain Regularities in the Oxygen Effect	146			
	Pasynskiy, A. G., and T. Ye. Pavlovskaya [Institute of Bio-chemistry imeni A. N. Bakh, AS USSR]. Dependence of the Oxygen Effect on the Correlation of the Dose and the Substrate Concentration in Irradiated Cysteine Solutions	153	•	m The state of the	
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S/829/60/000/000/005/005 D243/D308

27 12:30

AUTHOR:

Lydus, L.Kh.

TITLE:

The significance of the peculiarities of energetic states of macromolecules for understanding radio-

biological phenomena

SOURCE:

Fiziko-khimicheskiye i strukturnyye osnovy biologicheskikh yavleniy; sbornik rabot. Inst. biol. fiz. AN SSSR, Moscow, Izd-vo AN SSSR, 1960, 133-141

Attempts to understand the action of radiation on living organisms have ignored the structural peculiarities of biological macro-molecules. The reaction between radiation and biological structures has two aspects: the absorption of energy and its subsequent utilization by the object. The second aspect is generally ignored and needs to be reconsidered. The migration of absorbed energy to 'weak' spots in the structure of the organism, and the conservation of part of the energy in so-called 'excited' states, which exhibit a disturbed electron structure are discussed. The physio-

Gard 1/3

S/829/60/000/000/005/005 D243/D308

The significance ...

logical and physico-chemical nature of radiation 'after-effects' is considered and the reaction of objects, after radiation, to a fall in temperature is explained in terms of the 'excited' states. A comprehensive theory to cover both migration and conservation of energy in macromolecular structures has not yet been developed. Some experiments on myosin are described, which use adenosine triphosphatase activity to estimate radiation sensitivity, and (a) seek to prove the occurrence of migration and conservation of energy and (b) analyze the radiobiological phenomena, assuming the occurrence. A protective mechanism is suggested which involves the transfer via conductors of radiation energy from the protected object to the pro-This mechanism was confirmed when actin was made to form a complex with previously irradiated myosin, then withdrawn and the adenosine triphosphatase activity of the irradiated myosin measured before and after complex formation. Protection of irradiated complex was also demonstrated. The role of oxygen in radiobiological phenomena is considered to involve a two-stage process in which oxygen acts by reacting with 'excited' molecules and inactivating them, and not by participating in water radiolysis. This view is support-Card 2/3

The significance ...

S/829/60/000/000/005/005 D243/D308

ed by P. Alexander (Rad. Res. 6, 653, 1957). The reaction seems to be applicable generally but the physical mechanism of the oxygen-'excited' molecule reaction is still unclear. Finally, the possible relation between 'excited' states and the toxic factors which appear at the time of radiation are considered. There are 6 references.

ASSOCIATION:

Institut biologicheskoy fiziki AN SSSR, Moskva (Institute of Biological Physics, AN USSR, Moscow)

X

Card 3/3

EYDUS, L.Kh.; KAYUSHIN, L.P.

Jong-lasting conservation of unpaired electrons in macromolecules following irradiation of protein solutions. Dokl. AN SSSR 135 no.6: 1525-1527 D '60. (MIRA 13:12)

1. Institut biologicheskoy fiziki Akademii nauk SSSR. Predstavleno akademikom H.M. Sisakyanom.
(GAMMA RAYS--PHYSIOLOGICAL EFFECT) (PROTEINS)

EYDUS, L.Kh.; GANASSI, Ye.E.

Existence of several types of latent injuries in irradiated myosin molecules. Biofizika 5 no.3:334-338 '60. (MIRA 13:7)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.
(MIOSIN) (GAMMA RAYS—PHYSIOLOGICAL EFFECT)

EYDUS, L.Kh.; GANASSI, Ye.E.

Analyzing the action of principal physical factors modifying radiosensitivity. Biofizika 5 no. 5:523-532 '60. (MIRA 13:10)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.

(RADIATION—PHYSIOLOGICAL EFFECT) (ELECTRONS)

GANASSI, Ye.E.; KONDAKOVA, N.V.; OTAROVA, G.K.; EYDUS, L.Kh.

Common features of the manifestation of radiation aftereffect in proteins of different structure; comparative investigation of myosin and pepsin. Radiobiological no.1:14-22 '61; (MIRAL4:7)

1. Institut biologicheskoy fiziki AN SSSR, Moskva. (GAMMA RAYS—PHYSIOLOGICAL EFFECT) (MYOSIN) (PEPSIN)

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S/020/61/140/002/023/023 B103/B101

21.7200 AUTHORS:

Egdue, L. Kh., Ganassi, Ye. E., and Otarova, G. K.

TITLE:

The role of water in the irradiation "aftereffect"

PERIODICAL:

Card 1/A

Akademiya nauk SSSR. Doklady, v. 140, no. 2, 1961. 475-478

TEXT: The authors report on experiments concerning the thermal iractivation of intact pepsin and pepsin irradiated with \cos^{60} y-rays. The results confirmed the assumption saying that the aftereffect of irradiation is caused by water. The role of water was explained by comparing the aftereffects in the presence and absence of water. The decrease of the proteolytic activity of pepsin, determined from the specific absorption (at $\lambda = 280~\text{Mg}$) of the proteolytic products of hemoglobin, was used as a criterion of its damages. Pepsin solutions were studied in acetate buffer solution, (pH = 4.05-4.80) or in anhydrous glycerol (adjusted to pH = 4.6 by acidification with glacial acetic acid). The pepsin was obtained by the Northrop method as modified by G. A. Levdikova (Vopr. med. khimii, 2, 53 (1956)). In the laboratory of Professor A. S. Kuz'minskiy, Vseseyuznyy nauchno-issledevatel'skiy institut rezinovoy promyshlennosti (All-Union

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The role of water in the ...

Scientific Research Institute of the Rubber Industry), dry pepsin was irradiated with a Co60 y-radiation dose of 104 r/min. The irradiation of the person solutions with Co60 was carried out with the CVB3-800 (GUBE-800) device of the Institut biofiziki AN SSSR (Institute of Biophysics, AS USSR) with a dose of ~500 r/min and at room temperature. The thermal inactivation of the dry pepsin was performed a) in an air thermostat (100-130°C), b) in an ultrathermostat filled with glycerol (130-150°C), pepsin solutions were inactivated in the ultrathermostat. It has previously been shown (E. Ye. Ganassi et al., Radiobiologiya, 1, no. 1 (1961); Ref. 6, see below) that irradiation causes latent damages in both fissiclived and dry pepsin, which account for the thermal aftereffect. In both cases, the protein incubated in solution after irradiation is interested more quickly than the intact one, and partly loses its activity. This loss characterizes the "intensity" of the aftereffect, and increases with increasing direct radiation damage. To explain the role of water in the thermal aftereffect, dry pepsin was irradiated with 5 to 11 million r and then exposed to temperatures of 100-150°C. At the same time, dry, non-irradiated pepsin was incubated under equal conditions. The time of incubation differed as a result of the temperature Card 2/4

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The role of water in the ...

dependence of the rate of thermal inactivation. Intact and irradiated proteins showed the same rate. The ratio was 1.00 \pm 0.002, which indicates the absence of a thermal aftereffect. It is noted that either the high temperature exerts a protective action, so that there are no latent damages in the protein after incubation, or water is indispensable for the occurrence of an aftereffect. In order to prove this, the protein which had been thermally inactivated in dry state, was dissolved in acetate buffer and incubated in solution between 47 and 54°C. At these temperatures the thermal aftereffect was noticeable. Its activation energy was equal to that of protein which had not been heated prior to dissolution. The intensity of the irradiation aftereffect-depended only on the dose, but neither on the time nor on the temperature of the preceding heating of the irradiated, dry protein. Thus, heating does not eliminate the causes of the aftereffect, but without water the latter did not become manifest. The authors attempted to prove in how far the role of water in this aftereffect is a specific property of water. Pepsin irradiated in dry state was dissolved in anhydrous glycerol. Also in this case the irradiated pepsin was inactivated at the same rate as the intact one. Hence, there is no thermal aftereffect under these conditions. Protein heated in Card 3/4

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The role of water in the ...

glycerol was dissolved in an acetate buffer solution, and exhibited a typical thermal aftereffect whose intensity was determined only by the radiation damage. The results obtained indicate that water is required for the manifestation of latent damages responsible for the thermal aftereffect of irradiation. Also the detrimental action of oxygen will not become manifest without water. There are 2 figures, 2 tables, and 8 references: 6 Soviet and 2 non-Soviet. The two references to Englishlanguage publications read as follows: Ref. 6: R. S. Anderson. Brit. J. Radiol., 27, 56 (1954); Ref. 6: D. L. Dewey, Nature, 187, 1008 (1960).

Institut biclogicheskoy fiziki Akademii nauk SSSR ASSOCIATION:

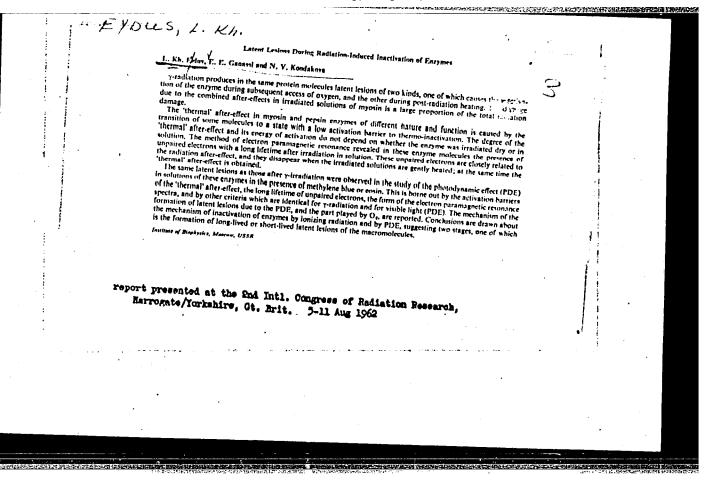
(Institute of Biophysics of the Academy of Sciences USSR)

- April 10, 1961 by N. M. Sisakyan, Academician PRESENTED:

March 30, 1961 SUBMITTED:

Card 4/4

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	,	Mode of Action of Factors A	andifying the Effect of Ionizing	Radiation on Protein			
	y _{E.1}	E. Ganassi and L. Kh. Edius			\mathcal{D}	·	
	in the second of	The effect was investigated of various physical and chemical factors (heat, oxygen, water, protective chemical substances, etc.) which modify radiation injury to proteins. Oxygen had no effect on the inactivation of pepun in aqueeus solution. However, the 'oxygen effect' is observed in the presence of some chemicals (e.g. sodium metabuighlic). When protein solutions were irradiated in an acctate or phosphate buffer or in the presence of some other substances, an 'invene' oxygen effect was observed and the inactivation of the enzyme was reduced in the presence of oxygen. When dry pepsin was irradiated, that parf of the enzyme which remained active had latent injuries which caused the appearance of the 'thermal' after-effect. It was shown that the 'thermal' after-effect requires the presence of water; when the irradiated enzyme is finated in the dry state or dissolved in anhydrous glycerol, the fatent injuries do not appear and the after-effect cannot be observed. The irradiated enzyme is finativated by heat in the same way as the non-irradiated one. The 'thermal' after-effect can be detected only in solution. Myouin solutions irradiated anaerobically give an after-effect can be the heat and O ₂ . It was shown that each of these two agents acts on only one of two different kinds of latent injury which arise in the enzyme molecule. The study of the effect of various chemicals on the radio-e-militivity of pepsin disclosed the existence of an apparently non-specific mechanism of protection, discussed in the report.					
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AUTHORS:

Ganassi, Ye. E. and Eydus, L. Kh.

S/205/62/002/002/015/015 I020/I215

TITLE:

A possible general operating mechanism of protective agents

PERIODICAL:

Radiobiologiya, v. 2, no. 2, 1962, 332-334

TEXT: Loss in proteolytic activity of a 0.02 mg/ml aqueous pepsin solution (pH 4.5-4.6) exposed to Co^{60} gamma rays was examined by Anson's method. AET, sodium nembutal, cystamine, sodium metabisulfate and β -alamine were used as protective agents. The inactivation of pepsin depends exponentially upon the radiation dose and the protein concentration. It is suggested that a part of the molecule is blocked by the protective agent so that inactivating factors (free water radicals or oxygen) have no access to it. The enzyme itself is composed of two parts: one part is rapidly inactivated and its dose/inactivation dependence is the same as in the unprotected enzyme; the second part is practically not inactivated over a wide dose range. Some molecules are unblocked after a while and inactivated before being blocked again. Increased temperature during irradiation, and a longer irradiation period (with a decreased dose rate) brought about a more extensive inactivation of the blocked part of the enzyme. There is a direct dependence between the molecular size of the protective agents and their protective effect. The mechanism described is non-specific since different agents showed the same effect.

SUBMITTED:

January 5, 1962.

Card 1/1

X

EYDUS, L.kh.

Hypothesis of the physical nature of the forces of muscular contraction. Dokl. AN SSSR 147 no.5:1204-1207 D '62.

(MIRA 16:2)

1. Institut biologicheskoy fiziki AN SSSR. Predstavleno akademikom N.M. Sisakyanom.

(MUSCLE-MOTILITY)

Mechanism of muscle contraction. Biofizika 7 no.6:683-690 (62. (MIRA 17:1)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.

EHT(1)/EHT(m)/BDS--AFFTC/AMD/ASD--RM/AR/K 8/0205/63/003/003/0440/0446 L 11247-63 ACCESSION NR: AP3001071

AUTHOR: Ganassi, Ye. E.; Rydus, L. Kh.; Arifulina, R. A.

TITLE: Investigation in vitro of the action mechanism of chemical protective substances. Report 1

SOURCE: Radiobiologiya, v. 3, no. 3, 1963, 440-446

TOPIC TAGS: aminoethylisotiuron (AFT), vinbarbital sodium, mercamine, bisulfate sodium, pepsin solution, gamma radiation, action mechanism

ABSTRACT: Most protective action theories are based on the known properties of a given protective substance itself rather than a mechanism common to protective substances. The present work investigates systematically the protective action of aminoethylisotiuron /(AET), vinbarbital sodium, mercamine, /bisulfate sodium, and beta-alamin, to which different action mechanisms have been attributed. The action mechanisms were studied by means of radiation inactivation of pepsin water solutions which were gamma irradiated from Co sup 60 or Cs sup 137 sources at 370 r/min. Radiation inactivation of pepsin in water takes place according to an exponential law, that is, the power of radiation increases with decrease of solution concentration. Figures 1-4 show pepsin irradiation inactivation in the presence of different protective substance concentrations. By analyzing the change of these dosage curves Card 1/2

L 11247-63 ACCESSION NR: AP3001071

in the presence of the various protective substance concentrations, a mechanism common to all the protective substances is determined. Each substance apparently blocks radiosensitive parts of the protein molecule surface from oxygen access for a sufficiently prolonged time and this prevents hidden injuries of the "oxygen" type. "The authors express their gratitude to the doctor of biological sciences N. I. Shapiro and V. I. Suslikov for valuable remarks in discussing the study." Orig. art. has: 7 figures, 1 table.

ASSOCIATION: Institut biologicheskoy fiziki AN SSSR, Moscow (Institute of Biological Physics AN SSSR)

SUBMITTED: 010ct62

DATE ACQD: 01Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 013

OTHER: 012

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"APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00041231

Nature of "inverse" oxygen effect in ionizing radiation. Radiobiologiia 3 no. 6:920-922 '63. (MIRA 17:7)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.

GANASSI, Ye.E.; EYDUS, L.Kh.; ARIFULINA, R.A.

Participation of oxygen in the radiation inactivation of dry enzymes. Radiobiologiia 4 no.1:41-46 '64. (MIRA 17:4)

1. Institut biologicheskoy fiziki AN SSSR, Moskva.

ACCESSION NR: AP4027988

s/0205/64/004/002/0329/0334

AUTHOR: Eydus, L. Kh.

TITLE: Discussion. Oxygen participation in radiobiological effects

SOURCE: Radiobiologiya, v. 4, no. 2, 1964, 329-334

TOPIC TAGS: oxygen effect, oxygen effect popular hypothesis, oxygen effect new hypothesis, latent radiation injury, radiation injury reparation, water radical, sulfhydryl radical, macromolecule injury, repairing radical, partial oxygen tension, oxygen effect absence

ABSTRACT: The author disagrees with the popular hypothesis that in ionizing radiation the oxygen effect is lependent on competition between oxygen and sulfhydryl protectors, the hydrogen donors, for latent injuries in the macrowolecules. A new oxygen effect hypothesis is offered based on the following positions: a) with indirect radiation action, OH radicals (so-called water radicals), formed as a result of water radiolysis, produce latent injuries by damaging the biologically important macromolecules, b) if there are low molecular admixtures present in the solution besides the macromolecules, then

Card 1/3

ACCESSION NR: AP4027988

the water radicals may be taken over by them to form admixture radicals, c) latent injuries of macromolecules (or at least part of them) before being realized into visible injuries may be repaired by interaction with certain admixture radicals (so-called repairing radicals, RR), particularly sulfhydryl compounds, and d) oxygen, present in the medium during irradiation, in interaction with the repairing radicals (RR) disactivates them. The degree of damage with the same admixtures increases in the presence of oxygen compared to anaerobic irradiation. Thus, according to the popular hypothesis reparation is accomplished by the molecules of the admixture itself and oxygen effect takes place when admixture molecules (RR) interact with oxygen. According to the new hypothesis, the admixture molecules (RR) do not interact with oxygen. Reparation is accomplished by the admixture radicals (RR) and the oxygen effect takes place when oxygen interacts with the admixture radicals (RR). The following aspects of the new oxygen effect hypothesis are discussed: dependence of oxygen effect value on partial oxygen tension, relation between "direct" and "reverse" oxygen effect, absence of oxygen effect with intense ionizing radiation action, and absence of chemical protection with intense ionizing radiation action. "The author expresses his gratitude to

Card 2/3

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Professor Ya. L. Shekh valuable discussion."	tman, Ye. E. Ganassi, and V. Orig. art. has: 2 figures a	I. Suslikov for nd l table.	
ASSOCIATION: Institut (Biological Physics In	biologicheskoy fiziki AN SSS stitute AN SSSR)	R, Moscow	
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GRAYEVSKIY, E.Ya.; KOROGODIN, V.I.; KUZIN, A.M., ; MOJKALEV, Yu.I.; SMIRHOV, K.V.; STREL'ISOVA, V.N.; SHAPIRO, N.I., doktor biol. nauk; SHIKHODYROV, V.V.; EYLUS, L.Kh.; ALEKSAKHIN, R.M., red.

[Principles of radiobiology] Osnovy radiatsionnoi biologii. Moskva, Nauka, 1964. 402 p. (EIRA 18:1)

- 1. Akademiya nauk SSSR. Institut biologicheskoy fiziki.
- 2. Chlen-korrespondent AN SSSR (for Kuzin).

L 9871-66 EWI (m) SOURCE CODE: UR/0020/65/164/005/1171/1174 AT5026992 ACC NR: M. (Academician) AUTHOR: Eydus, L. Kh.; Otarova, ORG: IBFANS Institute of Biological Thysics, AN SSSR (Institut biologicheskoy fisiki 44,55 AN SSSR) TITLE: Screening of macromolecules from latent radiation damage SOURCE: AN SSSR. Doklady, v. 164, no. 5, 1965, 1171-1174 TOPIC TAGS: gamma ray, radiation damage, ensyme, myology ABSTRACT: Under the influence of ion-emission the inactivation of many ensymes proceeded in two stages. First, a latent damage was developed in the albumin molecules, and then the latent damage was converted into an apparent damage under the action of heat and oxygen. This process was associated with a partial expansion of the molecules accompanied by a loss in shape, depending on the enzymic condition of the albumin. If the conditions preventing the expansion of molecules could be UDC: 557.391

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ACC NR: AP5026992

found, then these could also eliminate radiation damage. Such conditions could be created synthetically. The experiments were conducted with solutions of myosin (M) in 0.5M KGl, irradiated by Co^{OO} %-rays. In a first series of experiments ATP (adenosine triphosphate) was added to a myosin solution in amounts of 0.1-0.5%. The solutions were incubated at 37 C. These experiments proved that in the presence of ATP the activity of the intact albumin as well as nearly all the albumin with latent damage was not disrupted. However, the assumption that ATP might require the latent damage was not confirmed, as ATP only prevented the development of latent damage. The screening effect of admixtures was produced because their molecules were absorbed on the albumin, preventing the partial expansion of damaged molecules in the second stage of inactivation. Orig. art. has: 4 diagrams.

SUB CODE: 06/ SUBM DATE: 10Dec64/

NR REF SOV: 007/ OTHER: 003

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GANASSI, Ye.E., ZARKH, Ye.N., KONDAKOVA, N.V., FYDUS, L.Kh.

Physicochemical study of the mechanism of enzyme inactivation.

Report No.1. Thermal inactivation of myosin and pepsin, intact and following irradiation. Biofizika 10 no.6:966-973 65.

(MIRA 19:1)

1. Institut biologicheskoy fiziki AN SSSR, Moskva. Submitted April 29, 1965.